Mayor's Special Advisory Committee On Technology Implementation

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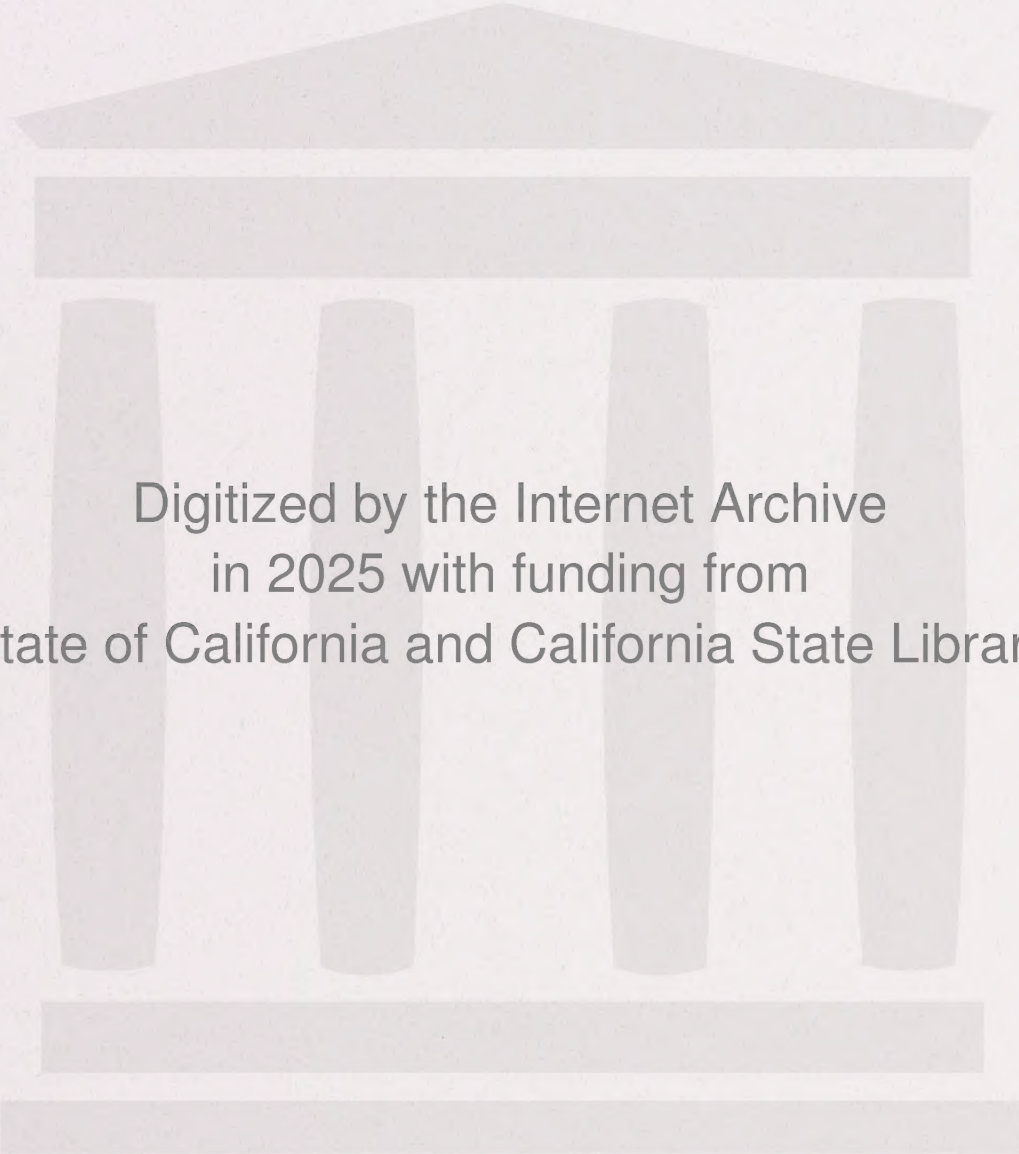with the
People

Improve Public Services

Increase Public Safety

Support City Employees

Reform Organizational
Structure and Management

Establish City Information
Technology Infrastructure

Develop Strategic Alliances

Mayor's Special Advisory Committee on Technology Implementation

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The Committee started as a group of twenty appointees. It recruited additional participants with diverse backgrounds from business, labor, technology, and government, creating a team of over 200 volunteers. In researching and collecting data and ideas, these volunteers in turn called on many people, both inside and outside the city, to create a body of over a thousand individuals involved in reaching the recommendations of our Committee. The Committee's appreciation for the tens of thousands of pro bono hours by all the volunteers cannot be overstated. Certain organizations deserve an unusual thank you for extraordinary contributions which far exceeded anything we could have thought to request.

Michael Erdei of Hughes Aircraft jump started the Special Advisory Committee efforts by interviewing the key information and communication systems decision makers, implementers and clients in the city government, providing a preliminary report on the current state of technology in the city.

From Southern California Gas Company came Jonel Hill who juggled all the Special Projects Team Leaders, and produced our written report.

Pacific Bell contributed its Vice President Government Affairs, Gayle Sylvain Greenwood. who served as Deputy Chair of the Synthesis Task Force, and provided PacBell support staff for every task force.

Hewlett-Packard gave us Tom Ray, our Technology Task Force Chair and donated the electronic copies of our report.

Tim Psomas, of Psomas and Associates, led the Geographic Information Systems team research and put GIS coordinating staff on every task force.

Finally, we acknowledge the contributions of The Nettleship Group which provided Richard Scaglione and Candace Gates who worked tirelessly the entire 30 weeks coordinating the 200-person program management team, and donated the services of editor and facilitator Ed Brown; Communications Technology Team Leader Michael Ariew; Internet researcher/graphic designer Michael Reed; writers Lisa Valleau and Margaret Davis; and proofreader Marguerite Jorgensen.

Acknowledgments

"These Americans are the most peculiar people in the world. You'll not believe it when I tell you how they behave. In a local community in their country, a citizen may conceive of some need which is not being met. What does he do? He goes across the street and discusses it with his neighbor. Then what happens? A committee comes into existence and then the committee begins functioning on behalf of that need. And you won't believe this but it is true, all of this is done without reference to any Bureaucrat. All of this is done by the private citizens on their own initiative."

Alexis de Tocqueville, 1832.

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Mission

In its report to Mayor Riordan, the Special Advisory Committee on Fiscal Administration recommended that the city invest more than $70 million over a five-year period to realize long-term technology efficiencies and cost savings. In response, on June 15, 1994, the Mayor asked for the formation of a Special Advisory Committee for Technology Implementation, articulating his vision:

"I envision a city where citizens can conveniently access governmental services, retrieve data and information, and participate in the formation of public policy. Via computers, telephones, televisions and radios from homes, schools, businesses, libraries and malls, public access to services and participation in government can be improved.

Los Angeles needs to participate publicly and privately in the building of the Information Superhighway, assuring the citizens and businesses of Los Angeles access to the communications links of the fast-approaching future."

Our Committee was tasked with reviewing ways technology could provide for a more functional, accessible, and cost-effective government, equipping Los Angeles to meet the demands of the future.

The Committee's work was divided among six task forces, which focused on internal and external government, public access, and technology issues. The task forces created their own subcommittee focus groups and spent tens of thousands of volunteer hours accumulating data, opinions, and citizen wish lists in a true grass roots fashion, researching options and developing consensus recommendations. By the completion of this report, we had involved over a thousand volunteers in reaching the recommendations of our Committee.

Vision

Drawing on the diversity of the Committee and Task Force participants, a strong consensus was reached on a vision for the future:

We Envision

■ a city where citizens have easy access to information and services; where government is a partner, addressing community-wide concerns.

■ a city where quality customer service is the hallmark of the organizational culture; an interactive 'Town Hall' where access to information empowers employees to provide solutions.

■ a safer city, with technology increasing police, fire and 9-1-1 effectiveness; a city that responds quickly, effectively and efficiently in a crisis.

■ a city with a strong economy, capable of attracting an increased market share of new business in an increasingly globally competitive environment. We see new technologies supporting the major industries of Los Angeles, and creating easier access for small business.

■ an organizational structure that provides incentives for eliminating obsolete practices, reinvigorating employee satisfaction and increasing productivity.

■ a city where the infrastructure provides for internal and external connectivity, data sharing across departments and with the private sector.

■ a city where the staff has the tools, information and authority to serve Angelenos and other customers effectively.

■ a city management structure where managers can be held accountable for developing and implementing sound public policies and services - efficiently, collaboratively and effectively.

■ a city which actively collaborates and forms partnerships with other jurisdictions, organizations and the private sector effectively employing emerging information technology tools.

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Synopsis

What We Discovered

For decades, technology has been a low priority in the city. The city's 'current' technology plan was written and completed before Bill Gates founded Microsoft. This plan has never been updated to include emerging distributed computing and networking technologies.

Cumbersome decision making processes and a lack of vision, not to mention a lack of resources, have kept the city from implementing technological solutions which could save millions of dollars, substantially increase levels of service to Angelenos, and open access to City Hall.

Evidence of how a lack of technology, and poor implementation of technology, impacts the functioning of government come from all corners of the city. Examples:

- **Lost Revenues:** Hundreds of thousands of dollars in revenues and fees are currently uncollected because there is no mechanism in place to identify and efficiently collect them. The tax collection system is not adequately automated, and potentially 30% of the taxes, fees and payments owed to the city go uncollected.

- **Public Safety Concerns:** We found that telecommunications and information technology for Los Angeles' life support services have suffered from a shortage of coordination and plan-

"We are observing (or participating in) one of those critical points in societal development that will shape how we work, how we plan, how we relate to each other, and most importantly, how we learn and grow personally and professionally. This is the Information Revolution - not unlike the Industrial Revolution in which the tools and the anticipated utilization of those tools changed forever America's future."

Commentary/Summer 1994

ning. The LAPD, fire department, and 9-1-1 emergency systems employ separate information and radio communications protocols. These systems were not designed to communicate with one another. The result: urgent pleas for help during routine emergencies and events like the Northridge quake are sometimes dangerously delayed.

- **Asset Management:** For many departments, there is no computerized list of what the city owns. The inventory process uses 20-year-old technology, which hampers report generation and requires labor intensive "scavenger hunt" processes to update to verify ownership and location of property.

- **Wasted Time:** Most city employees do not have a computer or voice mail; lack of these basic tools results in thousands of hours being wasted by employees doing office work manually and playing 'telephone tag.'

Simple data retrieval, which could take seconds, frequently takes days.

- **Poor Public Service:** The city has no central database to identify the resources that it provides. Accordingly, city employees often do not know where to send a constituent in need of service.

- **Inaccessible Records:** Basic public records, such as building permits, are not computerized. Records are frequently lost or are simply inaccessible. Imagine being asked to inspect a facility for compliance with permits when the permits needed to perform the inspection are not available. Departments have limited technological ability to communicate with each other. Firefighters often cannot quickly find out whether a building contains toxic or hazardous materials.

- **Lack of Interdepartmental Collaboration:** Geographic information systems have been or

are being developed using four different software technologies. Each department has its own cash processing and accounts receivable system. These, and many other examples, result in inefficient use of millions of taxpayer dollars.

- Inadequate Management of Technology Implementation Projects: Over the last five years, three out of four recent major systems developments have had significant problems. Nearly $20 million has been spent with contractors on projects that have been canceled or are being restructured due to schedule and cost overruns and major disputes with the vendors over project scope.

- Exorbitant Operating Costs: The payroll system is over 25 years old. The city spends more than $800,000 a year in maintenance, much of which would not be required with a modern system.

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Efforts Underway

While serious deficiencies and obstacles to implementing technology exist, there is a growing level of recognition that solutions could be realized and that technology could be a powerful means of answering the city's pressing needs.

In the past year, technology has become a high priority item within the city. The Mayor and the City Council have allocated more than $10 million in basic personal computer systems and local area network (LAN) systems for the

City Attorney, City Clerk, Chief Legislative Analyst, City Administrative Officer, the City Council and the Mayor's office.

Most Council offices are experimenting with ways to use technology to better meet constituents' needs. Just two examples of their efforts are piloting a public information bulletin board system and a joint venture to install 24-hour City Hall kiosks.

City employees, many of whom are better computerized at home than in their offices, are eager for good technology; they understand how these tools could make them more productive and creative.

Departments are starting to speak with one another, and many used the task force forums to open up this process. Some common problems have been identified, which has stimulated a consensus support for change. Several departments have technology projects underway.

- The Department of Street Lighting is sharing data and participating in industry improvement dialogues globally via E-mail.

- City Departments of Planning, Building and Safety, General Services and the Bureau of Engineering are creating a network for the distribution of base maps.

- City Police Department experts have helped to develop cutting edge fingerprinting and advanced radio systems now being used across the country.

- The Library Department's CARL automation system allows access to the library's million volume collection using computer terminals in its Cen-

tral Library and in 20 of its branches (all 63 branches by the end of 1995); soon this will be available through a dial-up modem from home computers.

Specific Recommendations

Our Committee report not only addresses how the city could provide better or new services to its citizens using current technologies, but focuses on transforming organizational cultures and the roles its employees are asked to play.

We have determined that a change in organizational culture and thinking, a new structure for planning and implementing technology solutions, and a cooperative partnership with other public and private organizations are required. The Committee has identified core recommendations, many of which could be implemented immediately. Our recommendations focus on six major action areas:

- Improve Public Services

- Increase Public Safety

- Support City Employees

- Reform Organizational Structure and Management

- Establish City Information Technology Infrastructure

- Develop Strategic Alliances

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Improve Public Services

More often than not, the interviewed public expressed the belief that dealing with the city was dif-

ficult, time consuming and frustrating. Many who seek service or information are handed off from department to department, or queue to queue, and may never get the result they seek.

Delivery of service and information would be improved if the city were to work towards a 'single point' customer service philosophy. With accurate and centralized information, city employees should be able to provide information, or solve problems, at the first point of contact with the city. Critical to implementation is a comprehensive on-line central directory of city services, also necessary is substantial improvement in the coordination between departments.

Access to information and services should be provided from as many points as possible, taking the city to where the people are - supermarkets, shopping malls, airports, libraries, etc. Electronic public access should be provided at multiple access levels: free basic service, supplementary or enhanced services that are paid for by user fees, or revenues generated by advertising.

To Succeed We Must:

- Create a comprehensive electronic guide to city services.

- Develop a variety of electronic means for the public to access information and services or do business with the city, allowing access from many locations.

- Provide both basic free and fee-based services.

- Support the concept of 'single point' customer service by minimizing the number of contacts required for the public

to conduct business with the city.

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Increase Public Safety

Only seven percent of police officers have a computer. More than 40% of an officer's time is spent on paperwork. New and existing technologies would enable officers to spend more time policing the streets. Consultants estimate that computer technology would save enough time to put the equivalent of 368 additional officers on city streets. The Los Angeles Police Department is not alone in its need for technology; almost every city department lacks the technology commonly found in the private sector with which they must interact daily.

Police officers and firefighters simply do not have computers and other tools they need. Getting copies of police reports can take weeks and critical crime analysis systems have yet to be fully implemented. Work scheduling and deployment of police officers and firefighters is done by hand. Police and fire dispatchers cannot communicate across systems and are currently developing expensive new incompatible systems. During peak hours, waiting times on 9-1-1 are common.

Protection of life and property is one of the most important and reasonable uses for computer technology. We cannot afford, either from risk or cost effectiveness perspectives, to leave our police officers, firefighters, and 9-1-1 staff without access to effective office automation, integrated communi-

cations systems and top crime and data analysis tools.

To Succeed We Must:

- Integrate police and fire emergency response systems and centers.

- Accelerate implementation of Proposition M and N programs to improve and update the police and fire dispatch systems in conjunction with overall 9-1-1 systems.

- Modernize the LAPD by implementing systems to provide better crime analysis/intelligence and investigative support.

- Allow public safety project managers to use streamlined, alternative procurement processes to expedite acquisition and implementation of these systems.

- Support implementation of community-based police bulletin boards.

- Install software to provide effective personnel deployment management.

- Provide electronic access to information.

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Support City Employees

In an era of recession and widespread layoffs, all organizations, public and private, need to control their costs. Our recommendation for the city to make significant commitments to advanced information and communications systems is only partly justified as cost control. Information and commu-

nications systems are really about empowering employees, and solving human problems. When we fail to give city employees all the information they need, we prevent them from doing their jobs effectively. When we make city employees spend their time on paperwork, we prevent them from doing what they were hired to do. Certainly every hour that a police officer spends on paperwork is an hour that officer cannot spend making L.A. a safer place to live and work.

Modern computer technologies would offer the city's workers the opportunity to gain relief from hundreds of repetitive tasks required for manual processing of information. More importantly, it would allow them to focus their efforts on actual performance of the services and safety we need delivered. City staff accustomed to spending the clear majority of their time engaged in paper handling will be freed-up to spend their time working with the people whose needs they were hired to serve.

Implementation of new technology requires a large investment in training of both the information technology professionals implementing technology, and the eventual users. New technology changes the way people work and even the way they think about their job. Without the proper preparation, users will resist the changes and make the new systems fail. The city should assign responsibility for a pro-active information technology professional and user training program to the central information technology department. It should provide funding for the professional staff to keep up with technology via

training, seminars, and visits to organizations in government and industry which are recognized as using technology effectively.

The talented people found in city departments deserve the empowerment they seek. If the city gives them the vision, training, and support to deliver customer service - doing so in ways that do not allow technology to displace workers but focus on redirecting tasks to meaningful work not now getting accomplished - then technologies savings will support the objectives of improving public services and safety.

To Succeed We Must:

- Provide departments with modern computer technology.

- Implement electronic mail, with a city-wide directory, in all city departments to provide the foundation for elimination of paper, faster communication and new work flow processes.

- Expand telephone and voice mail capabilities to provide access for a broader number of city staff.

- Restructure the information technology job classifications to reflect the changes in the electronics, computing and communications industries.

- Make training a high priority.

- Develop a procedure for city employees to replace obsolete equipment with new technology.

- Provide city staff with access to the Internet and on-line databases

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Reform Organization Structure and Management

The city's current organization structure and management processes, unless changed, will result in millions wasted in investments in redundant and incompatible networks and systems. The current city procedures make it impossible to identify total information technology project costs. The current budgeting and management processes discourage interdepartment collaboration. Each department has its own budget and specialized funding. Budgeting and accounting is done by department, not by project; this conceals the total costs of a program that involves several departments.

The city's management processes emphasize detailed system controls and multiple approval levels at the expense of delegation of responsibility and accountability. There are no rewards for taking the risk of implementing new technology. Instead, cost savings are translated immediately into budget reductions. Poor management and contracting of large systems development projects has resulted in major schedule slippages, cost over-runs, and contract or project cancellations.

The city cannot continue to meet the growing demand for public services within the available fiscal constraints unless it exploits information technologies. The city must plan, fund and invest in a city-wide infrastructure that facilitates rapid communication and information sharing. Delivering effective results requires changing the organization structure, developing an overall strategy and plan, mandating inter-department col-

laboration, reforming the management culture to delegate responsibility and accountability, and rewarding innovation.

To Succeed We Must:

- Consolidate the core departments providing information services into one department with policy guidance from an executive steering committee.

- Develop an information technology strategy and plan as a framework for all information technology investments.

- Keep the city's technology current

- Overhaul the technology implementation project management processes.

- Use off-the-shelf rather than custom developed software when functionally appropriate and cost effective.

- Establish multi-year financial planning for information technology projects, subject to annual budget review, tied to specific deliverables.

- Re-engineer city processes to ensure technology investments succeed.

- Create and enhance accountability and reward innovation.

- Establish a best practices workshop

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Establish City Information Technology Infrastructure

No city-wide technology infrastructure exists today. A result of the city's decentralized management structure is that each department builds its own infrastructure to meet its own perceived needs. Although the city is rich with data, it is stored in formats that are incompatible and difficult to access. Multiple networks, using different technologies, connect various city departments and sites, but nothing connects departments and sites to each other to form a city-wide communication network.

The Committee recommends immediate development of a city-wide networked infrastructure to support the city's need for rapid communications and information sharing. The elements of such an infrastructure are the shared mainframe computing center(s), the network connecting all city facilities, the databases that need to be shared by multiple departments and with the public, and the application systems that are critical to overall effective management of the city.

To Succeed We Must:

- Acquire or build, in partnership with private industry and/or other government agencies, a broad band wide area network (WAN) connecting all city facilities.

- Evaluate consolidation of existing computing centers.

- Implement a disaster recovery plan for distributed computing systems.

- Develop system-wide databases to be shared by multiple departments and the public.

- Establish a city-wide Geographic Information Database.

- Re-engineer financial management processes and systems to improve cost visibility and accountability.

- Implement recommendations of the Mayor's Special Advisory Committee on Fiscal Administration.

  - Procure a city-wide accounts receivable system to recover $3 million annually.

  - Upgrade the tax and permit system (TAPS) to recover tens of millions annually.

- Meet the increasingly complex payroll need by outsourcing payroll services, upgrading the current system, or purchasing a new system.

- Implement a system to provide full document management capabilities, including imaging and workflow management.

- Conduct business electronically.

- Create a system to collect fees efficiently and reliably

- Combine existing independent network projects into one plan, addressing all city departments including DWP, Harbor, and Airports.

- Use well-supported state-of-the-art and emerging technologies.

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Develop Strategic Alliances

The city cannot afford to operate independently of other agencies, cities, counties or the federal government; however, the city finds it

difficult to share information or system development even among its own departments. The committee was unable to find a pattern of data sharing or cooperative development with other organizations.

Developing unique systems increases costs to the city, and sacrifices capabilities. New systems shared among a group of public agencies are typically planned, implemented, and tested to meet more diverse needs. In operation, systems which have more agencies collecting and entering information for all to share are more useful to everyone concerned.

To achieve systems of the future the city must actively seek opportunities to collaborate. New systems must be shared with other agencies, especially the County of Los Angeles and other local cities.

Where the city does not have data transfer capability, and cannot share an existing capability with some other organization, the possibility of leasing capability on existing lines must be considered. This will often be less expensive and faster than installing new dedicated lines. Shared processing of service functions with public and private entities must be sought whenever feasible.

The city should actively seek to share resources, such as fiber optic lines, cables, and GIS databases, with the private sector, which will also be interested in providing its customers with access to city information. Entities which could benefit financially from city information should be identified, with the objective of allowing such information services to be provided for a fee.

In instances where the city lacks funds to implement necessary technologies it should identify commercial providers able to offer collaborative opportunities to reduce or eliminate up-front costs. Example: A commercial entity might install equipment at little or no initial cost to the city, with the city paying for installation through productivity savings.

To Succeed We Must:

- Actively seek collaborative opportunities.

- Define commercialization strategies.

- Support the first goal of National Information Infrastructure (NII).

Recommendations

Improve Public Services

Where We Are

Despite its imposing structure and nearly omnipotent presence in every life, many citizens avoid City Hall. In interviews with Los Angeles residents, almost universally it was reported that dealing with city government is excruciatingly difficult. City Council Members' offices have resorted to establishing ombudsman-type services to guide citizens to the city employee who can help them. Citizens for the most part have come to see the city processes and bureaucracy as an impediment to gaining services and doing business.

Most city employees view existing city processes and structure as severe barriers to the services they are attempting to provide. Although the city's primary function is to provide service to its citizens, the city's organizational structure is inefficient for the delivery of services. Many examples were found where service or information requested crossed department jurisdictions and created confusion for both the city employees and the citizens. The result is that the customer is handed off from department to department, or queue to queue, and may never get the service or information sought.

In the public access meetings, the most repeated refrain was the frustration of learning where to go. The common experience was a 'three visit minimum.' On the first visit, a citizen goes to an office to learn where he should have gone. On the second visit, the customer learns what information he didn't bring that he needs, and on the third visit, the problem will be addressed if the customer is lucky. There is no excuse for this with today's technologies. At any point

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To report a dead dog on the street, the caller must try to guess which city department is responsible. Once the alternatives are narrowed, the customer still finds that there are several departments (depending on whether the dog is found on the street, the sidewalk, or private property) that may need to be called. No department will accept responsibility for the dog until the citizen demonstrates that the task falls within that department's jurisdiction.

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in the system, the network should provide city employees and the public with any necessary forms and instructions, and any other information necessary to process the request.

From the public's perspective, not only is interacting with the city confusing, intimidating and frequently frustrating, it is physically difficult. The city of Los Angeles incorporates nearly 470 square miles and spans 44 miles from its northernmost to southernmost points. Despite a vast geographic area, many city services can be obtained from relatively few access points. Clearly, the city's geographically truncated provision of services is out of step with the times. Providing services this way is not only inconvenient, it's more costly for both the city and the people it seeks to serve.

Where We Should Be Going

By implementing modern systems, the city will improve service to residents and businesses. Technology can help create 'single point of contact' service which will enable people who interact with the city to get what they need from one person, efficiently and conveniently. With access to a central, on-line city directory (which includes staff, responsibilities, phone numbers, mail stops, E-mail addresses and basic information about city services and processes) both the public and the staff will be able to find the service needed, without already knowing the correct person or department. The city can give citizens the ability to interact through their at-home televisions.

Once residents or business people contact city offices, their needs will be able to be met at that single point of contact because a well connected on-line system will al-

low city employees to access information and authorizations across departmental lines. Document imaging and integrated software will help streamline city practices to improve service to the public; an example may be found in Pasadena's recently opened one-stop permit center.

Other technologies can help the city achieve these goals. On-line systems (including the Internet) with public access via computer modem are common, inexpensive, and reliable today. Cable television access is also available today, and video-teleconferencing is becoming available. In the near future, we can expect translation services and other technologies to be practical.

By supporting programs to increase access to and use of computing and online technologies, the city will be saving money by cutting down on paperwork and minimizing public visits required to do business with the city. Moreover, by promoting training in the use of computing and telecommunications technology, the city will be broadening public access to the Information Super Highway and the future tools of democracy.

The city has some excellent opportunities to use kiosks which will deliver the type and kind of information people want, when they want it, and where they want it without the hassle they expect when dealing with City Hall. Kiosks also provide one of the opportunities we've identified for the city to collaborate with the private sector .

The city has the opportunity to give every citizen, every student, and every employee the skill and opportunity to join the system. It can provide this access through city offices, public/private access points, and the Internet. Every citizen must have the opportunity to use the system, even if the method by which they use computers is access through an instrument as familiar as their phone or their TV set.

While our report places a large emphasis on facilitating access to city-held information, that is only one of our concerns. The often-

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The U.S. Department of the Interior has implemented a voice-activated system for submittal of applications. This (1) reduces labor cost for the department; (2) standardizes the initial screening, ensuring fairness; (3) speeds the process; (4) advises that applicant on how to use the form; and (5) allows submittals 24 hours a day.

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forgotten link in creating a new information system strategy and vision is external information. This is why we propose universal access to external information worldwide: Internet. This is a spectacular worldwide source of information blind to race, creed, color and economic status, but fully open to ideas, creativity and intelligence. Internet offers unique educational opportunities that our over-burdened schools cannot; these connections especially benefit new 'charter' schools in which parents help determine curriculum.

The city should engage in partnerships to deliver a variety of levels and types of service in order to

meet the needs and requirements of as many people as possible.

These include:

Basic Services: Free and available to all regardless of where they live or their ability to pay. Some examples include information critical to basic survival; services for the disadvantaged; general public services; interactive Town Hall

Membership Services: Community organizations; access to property records; tax payment; library access; maintenance requests; neighborhood watch communications.

Fee-Based Services: Could be used to generate revenues which would contribute to payment for technology operations; examples:

Convenience Products: Such as city library performing remote research or time critical services.

Business Sponsored Services: Business announcements, airlines, travel information, and events. Note that this model is currently funding the Info Cal kiosks.

Individuals would have the no-cost opportunity to fill out preference profiles requesting that their names be added to targeted mailing lists, which the city would sell to firms interested in identifying who wanted to know about their products.

How We Get There

- Create a comprehensive electronic guide to city services.

Develop an electronic directory of city services for public and city

staff access as soon as possible in order to ensure that consistent and accurate information is available. It should include information on city departments, lists of key city staff and specific services available. The directory should be menu driven, searchable by key words or phrases, and assume that the user has no knowledge of city government organization; this should be accessible via an Internet web server, making this and other city information available world-wide. Make frequently requested forms and instructions available on-line, with the ability to pay fees with a credit or debit card; provide capability to fill out the forms on-line or print them for manual submission.

Prepare a study outlining fee vs. free policies of commercialization of data. Solicit participation from the business community and outside agencies in preparing this study.

Identify on-line fee services to industry: Business people who deal with the city regularly wanted to submit applications electronically, and volunteered to pay reasonable fees if they could get faster processing and 'real-time' status; the cost of processing a document submitted electronically would generate revenues and actually be significantly cheaper for the city to deliver.

Prepare standards to support commercialization of data.

Survey businesses to determine what information they might pay the city to distribute.

■ Develop a variety of different and distributed electronic means for the public to access information and services, or do business with the city, allowing access from many locations.

Develop alternative access points, geographically distributed throughout the city, for the public to get information and do business with the city. Such access points would include: Telephone voice response units providing information to the caller (similar to those used by banks to provide account information); the public using private or public computers with modems to dial into city databases, on-line systems and bulletin boards; automated fax service providing information materials 24 hours per day; expanded use of CityView not only to provide information, but to facilitate public participation and access to services; and teleconferencing technologies. Exhibit 9 discusses how the current City Electronic Bulletin Board system can become a useful communication medium. The city should develop, in cooperation with the private sector and other governmental organizations, public access multimedia kiosks placed in supermarkets, convenience stores, police stations, shopping malls and governmental agencies.

The Committee recommends that the city provide the ombudsman kiosks in the offices of the Mayor and Council Members. The kiosks will initially allow access to the services directory and other on-line city information. The ultimate goal is to provide single point access to all city services; this will help make information accessible to the public immediately.

■ Provide both basic free and fee-based services.

Determine which services and information that are basic and essential and make them accessible regardless of where a person lives or ability to pay. Provide supplementary or enhanced services that are paid for by user fees or advertising revenues.

Create a strategic plan for joint venturing with the private sector to develop and market enhanced services.

■ Support the concept of 'single point' customer service by minimizing the number of contacts required for the public to conduct business with the city.

The city must provide its customers with a modernized, electronic government to give them responsive and efficient access to information and services. The city employees should be able to meet the needs of public customers through a single point of contact; this could be achieved through better communication and cooperation between city departments, cross agency training and a comprehensive electronic database of city services. It may require some reorganization or redefinition of responsibilities.

Increase Public Safety

Where We Are

Over the past five years, a strong citywide consensus to provide increased resources for public safety has emerged. Public opinion polls have consistently ranked crime prevention as the number one concern of citizens; this groundswell led to passage of bond measures dedicating $475 million in public dollars to upgrading police and fire facilities and communications systems. Citizen volunteers with high tech skills have donated and developed at least two electronic bulletin boards to support rapid communication with neighborhood watch groups and improve community based policing, and have donated a voice mail system to one of the stations.

The Mayor's Alliance for a Safer L.A. is raising $15 million to provide basic office technology to the LAPD; in only three months, the Alliance achieved the first $9 million of its goal. The resources provided by the Mayor's Alliance will be used to implement local area networks (LANs) at each of the Department's 18 divisions, traffic bureaus, Parker Center and the new recruit training facility in Westchester. The LAN will pro-

vide E-mail, individual and group appointment scheduling, word processing, spreadsheet and database applications. The Alliance will also provide an Evidence Tracking System (bar coding), a Personnel Management System (CHRIS), a Vehicle Management System, printers and fax machines serving the detectives, officers and supervisory staff. A similar effort to provide basic administrative and communications tool to the Fire Department could improve its effectiveness as well.

Save $48.2M 1st Year, $20.2M Each Year Thereafter

The new technology provided by the Mayor's Alliance (for $15 million) will decrease the time required by officers to perform administrative, personnel and reporting tasks by up to 15%, saving the LAPD more than 640,000 hours annually. This is the full time equivalent of 368 patrol officers. If the city hired this many additional personnel, it would cost $28 million in first-year recruiting and training, plus $20.2 million annually in salaries and benefits.

Unrealistic public expectations (driven partially by media depiction's of police, fire and 9-1-1 capabilities), incompatible police and fire dispatch and communications systems, and insufficient funding from all levels of government, are major factors impairing public safety technology implementation. The challenges are daunting, from cumbersome planning and procurement regulations, which can add years to system de-

velopment time lines, to a lack of tools and training for project management, tracking and reporting. The departments also need ongoing funding for maintenance and replacement, as opposed to 'one shot' capital projects.

Both the fire and police departments accept emergency calls, track the location of vehicles, prioritize calls, and dispatch emergency services, over the same service areas. In an increasing number of cities (including large urban centers like Chicago), the same dispatchers handle both calls, reducing costs and improving service coordination. In Los Angeles, we not only have different dispatchers, but the two departments use incompatible systems - making interdepartmental communication during an emergency impossible. Moreover, if one system fails, the other cannot compensate.

The public safety departments have not in the past identified, nor do they now have, a long-term plan to implement basic functional level strategic system needs. They have no method to review system acquisitions in the context of emerging technologies versus presently available and installed technologies. The right balance will assure that maximum advan-

tage is taken of expected advances in information technology and expected major cost reductions.

The immediate need is for off-the-shelf hardware and software solutions to make police officers, investigators, detectives, firefighters and supervisors more effective. Currently a consultant is being selected to work with the police department to develop an action plan to address many of these strategic planning concerns. We think this is an important first step, but only the first step. The Chiefs and Commissioners for both departments must make a firm commitment to work towards an efficient and reliable public safety telecommunications infrastructure.

Where We Should Be Going

We envision a safer city, with technology increasing police, fire and 9-1-1 effectiveness; a city that responds quickly, effectively and efficiently. Critical to enabling our police officers and fire fighters to achieve their mission is the ability to manage their resources (human, financial and material) efficiently and to communicate seamlessly. Technology coupled with streamlined processes is the key success factor which must be provided to achieve this.

By providing basic tools of technology for administration, data analysis and electronic communication, connected via local and wide area networks, public safety staff will be able to file their reports electronically for immediate distribution and filing. Much of

the public safety staff communications will be paperless and direct. Changes in codes and practices, which now require photocopying and hand distribution to thousands of officers, will be routed electronically and delivered as part of a daily message. These same communications could be saved as part of an electronic library which could be searched by key words instantly.

Supervisors will be able to schedule and deploy officers and firefighters in a fraction of the current time. The city should procure new personnel software to help manage

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In 1988, the Police Department acquired Federal Communications Commission (FCC) authorization to utilize an additional 39 duplex radio channels. Failure to fund and implement systems on these channels during 1995 will result in forfeiture of that resource to other law enforcement entities. These channels are a finite resource and are IRREPLACEABLE.

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human resources records efficiently. Bar coding and scanners will speed up tracking and checking in and out of equipment.

Police officers and firefighters will be able to communicate quickly and seamlessly with each other. They will both be able to rely on a well trained civilian base of volunteers connected through electronic bulletin boards. When officers are in the field, their community based networks will remain strong because they will be able to receive and return messages via voice mail without having to return to the station. Document Management and Workflow systems (discussed under Recommendation 5) are particularly important to the

LAPD in improving their operations.

Further into the future, an enhanced 9-1-1 system will enable paramedics in another location to see, hear and take the vital signs of a victim, or read the label on a poison bottle in the hands of a frightened mother over a video telephone. Automatic language translation devices could enable public safety providers to communicate with the increasingly diverse population of Los Angeles, perhaps saving more lives or catching more criminals because they will be able to understand and speak over 100 languages. Rapid response and reassurance could be provided through almost instant damage assessment after an earthquake or during other disasters. Digital cameras in airplanes, helicopters, police and fire vehicles will not only transmit a picture of the damage, but plot it with accuracy's measured in inches on electronic maps that will also show every utility line, pipeline, and emergency response vehicle. A robust wide band voice, data and video communications web will blanket our region, surviving major disasters, and be ready at all times to provide communications among emergency personnel and with the public. An enhanced emergency communications system will be an emergency lane on the information superhighway, enabling help to break through during the worst crises.

How We Get There

- Consolidate the separate fire and police dispatch centers.

Plan for exchange of need-to-know data between public safety agencies. Integrate fire and police radio systems to improve coordination and personnel safety during routine incidents and declared emergencies. Develop and implement a joint plan to evolve to complete systems integration and redundancy between the police and fire command and control communications systems.

- Accelerate implementation of Proposition M and N programs to improve and update the police and fire dispatch systems in conjunction with overall 9-1-1 systems.

- Modernize the LAPD by implementing systems to provide better crime analysis/ intelligence and investigative support.

Acquire a robust, relational crime and arrest data system which is fully integrated with other department systems, accessible from PCs in the station, and compatible with Geographic Information Systems platforms and architecture now being implemented. Upgrade and enhance the current Advanced Fingerprint Identification System. Support implementation of the county/city joint project to install a digital mug shot system.

- Allow public safety project managers to use streamlined, alternative procurement processes to expedite acquisition and implementation of these systems.

- Support implementation of a community-based police bulletin boards.

The police department should expand the electronic bulletin board system citywide and work closely with neighboring cities and counties to coordinate community volunteers where jurisdictional boundaries meet.

- Provide software to support effective personnel deployment management.

Acquire a system which could provide real time information identifying the location and activities of deployed personnel. Purchase firefighter and police officer scheduling and timekeeping software.

- Provide electronic access to information.

Provide access to useful safety-oriented data and systems. Examples of important information include the California Penal Codes and Los Angeles Municipal Codes (including lay language interpretations of these codes), police officers could check, from their patrol cars, the police records of suspects in custody, before they are released. They could submit reports from their cars.

Support City Employees

Where We Are

The city has many employees who don't have the tools, training or organizational structures needed to get the job done.

City staff recognize that there are basic electronic tools which would increase their ability to accomplish the city's objectives. They know that today's computers are capable of talking to one another, working together and being hooked into other organizations via the 'information super-highway'. Our survey of automation found that out of 30,000 employees (excluding the proprietary departments), about 16,000 professional, management, and clerical office workers work with detailed information every day. Only 4,000 (25%) have access to electronic mail (E-mail), and 2,500 (16%) have voice mail boxes. This access tends to be concentrated in a few departments, with some departments having neither E-mail nor voice mail. This is a major barrier to tapping the creativity of the staff to improve service and productivity. Seventy percent of the city departments lack the necessary technology to implement electronic mail and voice mail. The level of office automation is significantly higher in the proprietary depart-ments, where the budgeting and procurement processes are not as cumbersome.

Training for distributed informa-tion technology and office auto-mation is woefully inadequate. Training budgets are the first to be cut in difficult financial times. As a result, it is hard for telecommu-nications and information systems staff to keep up with the rapid changes in technology. Citywide staff who must use the few elec-tronic tools available are not being adequately trained to accept and use these tools effectively. Some

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Surveying of city streets is done by hand. A simple hand-held device would require half the personnel and less time, thus freeing up staff for other important functions.

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city employees pay out of their own pocket to attend classes and seminars because they understand the importance of the training and the information exchange with their peers. Finally, as with most large organizations, the city cul-ture is resistant to change. Old expensive manual processes could be re-engineered away if the ap-propriate training and systems could be developed. It is reason-able to expect that new applica-tions will be developed by staff freed from mundane paper proc-essing chores.

The city's organizational structure (addressed in more detail in the next section) also provides a sig-nificant barrier to technology im-plementation. With few excep-tions, city departments working to implement technology to improve their efficiency and effectiveness have found the Communications Division of the Department of General Services to be a barrier, rather than an enabler, to progress. Without strong internal technical support, city departments have been forced to go without technol-ogy, hire their own systems staff, or turn to outside vendors to meet their needs. Moreover, the city's ability to hire and develop compe-tent technology profes-sionals is limited by job classifications which do not recognize the new and changing technolo-gies and by a cumber-some and inflexible hir-ing system which requires months of wait-ing and paperwork.

Where We Should Be Going

By providing technological tools, city jobs will become not only more meaningful, but more productively cost effective. All employees who work with in-formation need access to desktop computers or terminals, multi-system printers, data collection tools, fax machines and modems. Simple tools such as voice mail and E-mail will make a big differ-ence.

When city employees have access to the Internet, they will be able to communicate effectively with

other public agencies, and will have access to extensive information including many public databases. The Internet is a spectacular worldwide source of information blind to race, creed, color and economic status, but fully open to ideas, creativity and promoting intelligence, wherever it may be found. The Internet boasts almost 30 million people, with more than 1.5 million host computers attached to more than 13,000 separate networks linking more than 100 countries; these numbers grow hourly.

Departments also need a procedure to replace obsolete equipment when it is appropriate.

With adequate training for a changing workplace, the city will have a staff capable of utilizing modern technology. As personnel needs change with technology implementation, training and re-training programs will provide employees resources to convert their skills to those necessary in a technology based environment.

Training in the new methods produced by the uses of technology will not be confined to technical training. Management methods will change dramatically with the advantages of computer technology. Computers provide 'muscle' to do tasks. However, city em-ployees will be more productive if they have training, business process re-engineering skills, and the on-going support necessary to build a world class organization. The process doesn't begin or stop the day the equipment is delivered, an on-going strategy to improve city functions and support staff development is vital.

Kathy Rutkowski, editor and publisher of Virginia-based Net Tech News, told of an American teenager who posed questions through the Internet to a scientist, who turned out to be a Nobel laureate. With the scientist's help, the student built a project that won first prize in his science fair...the student was an American; the scientist was in Europe.

L.A. Times
October 16, 1994

How Do We Get There

- Provide departments with modern computer technology.

Provide employees with more and adequate desktop computers, printers, data collection tools, fax machines, modems, etc.

- Implement electronic mail, with a city-wide directory, in all city departments to provide the foundation for elimination of paper, faster communication and new work flow processes.

- Expand telephone and voice mail capabilities to provide access for a broader number of city staff.

All city staff who need to be reached on a regular basis regarding city business ought to be able to connect to the voice mail system regardless of whether or not they have a dedicated phone. Use voice mail as a mean of providing information to staff and members of the public regarding city business or events.

- Restructure the information technology job classifications to reflect the changes in the electronics, computing and communications industries.

Broaden the structure, make it more flexible, and provide for information technology technical and management positions in the operating departments.

- Make training a high priority.

- Develop a procedure for city employees to replace obsolete equipment with new technology.

- Provide city staff with access to the Internet and on-line databases.

Reform Organization Structures and Management

Where We Are

The city has no comprehensive city-wide information technology implementation strategy, encompassing voice, data, and video information, to achieve its objectives. The city's 'current' technology plan is more than a decade old and has never been updated to include new distributed computing and telecommunications technologies. The lack of an overall plan with buy-in by the operating departments results in waste and frustration as each department selects technology solutions to meet its own needs without considering the need to communicate and share data with the rest of the city and the public.

The city's organization structure is often described as a number of independent fiefdoms without unified leadership to bring about coordination across department boundaries. There is no planning process in which the management of the line departments could develop consensus on city-wide objectives and a city-wide technology infrastructure required to support them. There is no city-wide technology infrastructure budget. Joining together to build a common city technology infrastructure is not easy because each department has its own budget, often its own source of funds, and

always its own priorities. The budget process does not show the total cost of a project that crosses department boundaries. Incentives for information sharing and cooperation are non-existent.

Budget preparation is accomplished using unique department systems, mostly on standalone PCs. The department budget proposals are then provided to the City Administrative Office's office on standard forms. The City Administrative Office's budget analysts re-key the information onto their spreadsheets for analysis and consolidation into the final budget document.

There is no project management process for technology implementation. Information system project managers are given responsibility with no training or guidelines. The management and contracting of large systems development projects has resulted in major schedule slippages, cost overruns and project or contract cancellations. Millions have been spent with contractors on projects that have been canceled, or are being restructured, due to schedule and cost overruns and major disputes with the vendors over project scope. The Fire Command and Control Communications System is five years late and several million dollars over the original estimate, and is now the subject of a major disagreement with the vendor on the functional scope included in the contract. To date, $57 million of the $65 million in bonds issued have been obligated,

but the project is in trouble. The Building and Safety Plan Check and Inspection System is a year behind schedule and the contract has recently been canceled. The development of a city-wide personnel/payroll system by the Controller and Personnel Departments was canceled after an expenditure of over $3 million.

The process for approving technology implementation projects is time-consuming and costly. All major new technology implementations are multi-year projects, yet the city does not have a multi-year financial planning process. In order to avoid going through the cumbersome project approval process after each project phase, and thereby risking losing funding, the departments negotiate multi-year fixed price contracts for a system before the detailed functional specifications have been defined in enough detail. This results in schedule and cost problems, and adversarial relationships with vendors instead of partnerships to achieve a common goal. The project reporting disciplines are inadequate and the cost accounting system does not report the total costs of a project, including labor costs incurred by all city departments involved, even though the basic capability to do so exists. The City Administrative Office has hired a consultant to assess and recommend improvements in the city's systems development and contracting processes.

Information systems responsibilities in the city today follow the

paradigm of the 70's. There is a central information services organization that provides computing and programming services to the departments, and tries to control the implementation of new technology. The only professional positions allowed in the operating departments are systems analyst positions, even though more and more people in the departments are doing programming work on PCs, using 4th generation programming languages on the mainframe, or providing technical support to PC users. Communications services are separate from information services, and tend to emphasize voice communications.

The fragmentation of responsibility for telecommunications planning and implementation results in millions of dollars wasted in independent, overlapping networks and unnecessary delay in installing PC's and local area networks. For the non-proprietary departments, telecommunications planning is assigned to the Department of Telecommunications, without any funding for, or authority over, implementation. Implementation and operating responsibilities are shared by the Communications Division of the Department of General Services and the Department of Information Services, who are not required to follow the direction set by the Department of Telecommunications. A person needing to connect a PC to the network has to deal with both organizations, whose schedules and budgets are not coordinated, leading to unnecessary delays, extra work and aggravation.

Where We Should Be Going

Information technology is a critical resource for the city to support the growing demand for public services without a commensurate growth in costs. The city needs to create an organization environment that will encourage city managers and staff to exploit new technology to improve services to the public and increase productivity.

The information technology paradigm of the 90's is based on information sharing and networks, marrying voice, data, and video into multimedia information shared with customers, users, and managers. This vision requires an overall technology plan and architecture to facilitate electronic communications and information sharing. It also requires a realignment of information technology management responsibilities to:

■ Give operating departments responsibility for using technology as a tool to provide cost-effective services to the public

■ Give the central information technology organization responsibility for leading strategic planning and architectural development and for acquiring/building and managing the city-wide network infrastructure.

■ Involve city management and elected leadership in the strategic planning process and in establishing overall city priorities for major information technology investments.

■ Ensure operating department buy-in into technical and data standards.

Budgeting, funding, and management control processes must reflect the long-term investment nature of most information technology decisions. The traditional 1980's methods of justifying automation technologies will not allow organizations to compete in the 1990's. Traditional payback methods address only the bottom line benefits-eliminating jobs or reducing the number of people to do a given job. It has recently become obvious that well implemented projects have benefits extending much farther. Making data available to improve decision making wherever necessary, changes the way departments operate for the better.

Project management skill and disciplines must be improved and responsibility and accountability must be defined clearly to avoid repeating the problems on recent projects. Bureaucratic barriers in funding and acquisition processes must be broken down so that the system helps city staff get the job done instead of forcing them to beat the system in order to achieve any results.

Finally, the city must develop a management culture that:

■ Makes public service the first priority.

■ Empowers managers and staffs to make decisions and holds them accountable for results.

■ Encourages employees to wear a city, rather than just department hat, and incentivises inter-department cooperation and sharing.

- Rewards the risk-taking implied in implementing technology to improve service and reduce costs.

How We Get There

- Consolidate the departments providing information services into one department with policy guidance from an executive steering Committee.

As quickly as possible, consolidate Department of Information Services, the Department of Telecommunications and the Communications Services Division of the Department of General Services into one department. Establish an Information Technology Executive Steering Committee to involve senior city managers and elected officials in the development of city-wide information technology policy, priority and investment decisions; to review the status of major investment projects on a regular basis; and, to encourage collaboration and sharing across departmental lines.

Make the new department general manager responsible for providing the technical leadership and city-wide planning and coordination necessary to move the city's business processes into the future.

The committee strongly recommends that the city consider the creation of a quasi-governmental entity, a 'captive corporation'. The need for an independent agency to conduct these functions, serve as a conduit for cooperation with the information and telecommunications industries, and provide multi-year planning and budgeting cannot be overstated, and other cities have found this best achieve with quasi-

governmental agencies. The City of San Diego and the State of Washington, among others, have successfully used this approach. This alternative is expanded in Exhibit 1.

- Develop an information technology strategic plan as a framework for all information technology investments.

Assign a project manager to manage a multi-function team, including the proprietary departments, to develop an overall strategy, technical architecture and plan for the implementation of information technology in the city. The plan must include the requirements and participation of the proprietary departments, Water and Power, Harbor and Airports. The architecture should be based on open systems industry standards for seamless integration of the most cost-effective hardware and software to meet user needs. This will provide the required flexibility to select the best hardware/software tools for each function while supporting information sharing and communications. The city must ensure operating department buy-in into technical and data standards by using cross-functional teams led by the central information technology department to develop the standards.

Issue an RFP for a consulting firm experienced in strategic information technology planning to manage the planning process. The plan must be developed with the active participation and commitment of the city leadership.

- Keep the city's technology current.

Establish an Industry Advisory Board consisting of industry leaders, important 'customers' of the

city, vendors, and consultants to advise the Steering Committee on technology trends and best practices for serving the city's multiple constituencies on a continuing basis.

Implement a city-wide benchmarking program to track against the best practices in other cities, counties, states, and in the private sector. This should create a library of best practices for various processes applicable to city operations. The program should also create a series of workshops for city employees, to ensure that the benchmarking lessons are used to improve city services and reduce costs.

- Overhaul the technology implementation project management processes.

Implement project management disciplines and tools in common use in industry.

Create a Project Manager job classification which requires the appropriate skills and experience to manage activities that cross departmental boundaries, and manage the risks inherent in implementing new technology.

Ensure that a specific project manager is given the responsibility and authority for the success or failure of each project.

Require immediately that schedule and cost status reports be submitted quarterly to the Mayor's Office and the City Administrative Office for all information technology projects having a total estimated cost (all phases) of over $500,000.

Implement a streamlined acquisition and procurement process based on open standards and functionality. The recent modifications to the City Administrative

Office's Rule 13 are a small step in the right direction

- Use off-the-shelf rather than custom developed software when functionally appropriate and cost effective.

The city should implement a policy recommending that all information technology systems be commercial off-the-shelf systems. Variance should require a detailed analysis demonstrating cost benefits of a city-developed system, compared against at least two different commercial off-the-shelf systems.

- Establish multi-year financial planning for information technology projects, subject to annual budget review, tied to specific deliverables.

Establish an information technology planning and budgeting process that:

- Funds the building of the information technology infrastructure with a multi-year plan, subject to annual budget review.

- Clearly identifies information technology costs in all the departments.

- Provides city management and political leadership with visibility of the total investment in information technology.

- Is tied to specific deliverables and performance measures.

Develop an implementation plan to support the information technology recommendations in this report, providing executable action statements of the plan across city government. This action plan would serve as the road map for implementation identifying approaches to encourage and facilitate cooperation and serving as a catalyst for change. It should define specific goals and objectives for improving government use of technology in mission performance, both across and within agencies, and quantifiable measures for assessing service improvements to the public, as well as methods to continually benchmark against the best of private and public sector business practices.

Confirm priorities for information resources management and identify the budget and human resources necessary to support such objectives.

Establish a continuous improvement process to design, develop, and implement technology-enabled government-wide business initiatives - the electronic government.

Identify additional opportunities and oversee follow-up on additional opportunities for sharing information resources across agencies to improve program performance.

Use existing interagency groups for assistance where applicable.

Redesign the budget preparation process. Transfer budget proposals as data files from city departments to the City Administrative Office for review and analysis.

- Re-engineer city processes to ensure technology investments succeed.

Establish a policy that gives priority to projects that include re-engineering business processes across department boundaries. Require that all process re-engineering and automation project proposals include a forecast of the impact of the proposed changes on measures of performance, quality and cost of the business processes involved. Re-engineering is discussed in more detail in Exhibit 6.

- Create and enhance accountability and reward innovation.

Prepare amendments to the Charter line item budgeting provisions that are barriers to holding a department general manager responsible and accountable for making continuous improvements in the effectiveness and efficiency of services to the public.

Allow department general managers to reinvest a portion of cost savings in additional service or productivity improvement projects.

- Establish a Best Practices Workshop.

Best Practices are discussed in Exhibit 4.

Establish City Information Technology Infrastructure

Where We Are

The ultimate goal of implementing technology is to provide the information and communication necessary to develop and carry out sound public policies and provide top service to the public. To be successful, the city must have a technology infrastructure which connects people and information. By this we mean the computers and wired, or wireless, networks that provide access to the information needed by city staff and the public. Currently, the city does not have a coherent infrastructure. Where department infrastructures are in place, they are often incompatible, making data sharing or communication among systems effectively impossible. The city has no policy to address future radio spectrum for services that must be wireless. The major components of the city infrastructure are discussed below.

Connectivity

The city will achieve less than 10% of the potential of its investment in computers, software, local area networks, and database systems if they are not linked by a wide area network (WAN) to each other, the rest of the city, and the world (through Internet, on-line and select system access). A WAN is the physical or wireless connection which, for example, allows the police chief downtown to exchange information with the police stations instantly, or connects the firefighters with information about hazardous materials present before they arrive on the scene of a fire. The basic radio communications systems of the city used for dispatching emergency and non-emergency personnel depend on a communications network to link them together.

The city has over 60 independent networks, but there is no coherent, comprehensive plan for connecting them together. The Department of Transportation is building its own fiber-optic network connecting traffic signals throughout the city. The Library contracts out its own network connecting the branches to the Central Library. The independent departments, Water and Power, Harbor and Airports, are each responsible for their own network planning and implementation. Different departments have different needs, which must be accomodated in any network design. Public safety applications have critical data which requires fault tolerance. GIS applications require fast networks with high bandwidth for transmitting graphic data.

Other jurisdictions such as Los Angeles County, Caltrans, and Los Angeles County Metropolitan Transportation Authority are also installing fiber-optic cable that overlap city networks. All major city departments have plans to connect their facilities throughout the Los Angeles area. We estimate that based on current plans, not all completely defined and priced, the city will invest up to $100 million in the next five years, of which a significant percentage will be wasted if departments continue to implement independent networks. The Department of Telecommunications has made great strides toward gaining access to network resources by negotiating with the private sector and other jurisdictions. Moreover, it is currently finalizing a contract to develop a city-wide network plan.

The city has approximately 60 local area networks installed today, with the number increasing rapidly. The city does not have the network management tools that will allow integration of the local networks into a city-wide data sharing environment. These tools are essential to the management of network reliability and capacity.

Mainframe Computing Center

The city has two large mainframe computing centers, in the Department of Information Services and the Department of Water and Power, plus two smaller centers in the Harbor Department and the Department of Airports. The annual budgets of these four information systems organizations totals $50 million. (This number is artificially low compared to industry because purchased equipment is accounted for on a cash basis, with no depreciation.) The computing centers' staff includes 73

computer operators and 101 systems programmers. Companies such as First Interstate Bank, the Southern California Gas Company and Hughes Aircraft have realized large savings in equipment maintenance, software licenses and computing center staff by consolidating mainframe computing centers. Based on percentage savings realized by other organizations, a conservative estimate of potential savings is $10 million per year.

Disaster recovery procedures for the mainframe computing centers provide off-site protection for critical data and alternate processing sites in the event of a disaster. Procedures are in place and have been tested to process critical systems even if a data center is destroyed. However, these procedures do not exist for the 60-plus and growing number of LANs throughout the city. This could seriously impact the city's ability to do business in the event of a disaster.

Geographic Information Systems (GIS)

The need for geographic information, consisting of maps and text information that describes the location of a house, business, road, power line, fire hydrants, etc. is a basic ingredient of city activities as diverse as emergency dispatch, zoning, issuing permits, traffic control, and economic development. There are currently multiple digitized mapping systems installed in various city departments.

In 1988, a city-wide Geographic Information Management System (GIMS) master plan was published under the auspices of the City Administrative Office and approved by the City Council. The plan provided a blueprint for the development of geographic information systems and the sharing of these data in electronic form across departments and with private industry (architects, developers, contractors, etc.). The master plan was divided into three phases over ten years. The cost was estimated to be from $11 million to $24 million to acquire hardware and implement 16 application modules. While the project as a whole has never been funded, the Bureau of Engineering has built many digitized base maps and has added some layers of information on sewer lines and storm drains. The Planning, Building and Safety, Sanitation and other departments are now starting to automate their processes and need to add their data to the digitized maps. However, while an interdepartmental group has met regularly for the past year, the only current coordination is purely voluntary and no tight overall project management exists.

Financial Information Systems

Up-to-date, accessible, well presented financial information is the most critical resource required to run the city well. The city's financial management information system was not built to meet this need.

The central Financial Management Information System (FMIS) system meets the current requirements for overall city-wide financial control, but is user-hostile. Nor does it provide timely cost management information to department management. FMIS, which was implemented in the City of Los Angeles in 1987, is a highly customized version of the initial release of an American Management Systems (AMS) software package. Because of the extensive customization, upgrading to a current release of the AMS software is equivalent to implementing a whole new system, and would require extensive modifications of the new AMS software to fit city operating procedures, or significant changes to city operating procedures to utilize the AMS software with minimal changes. This would be a major project with long-term impacts on city operations. The first step should be a basic review of the city's accounting processes in the light of the city's future goals and financial conditions.

Most financial functions, except for general ledger, accounts payable, expenditures control and financial performance reporting, are supported by department-unique systems (manual or automated). In particular, there are no city-wide systems to support accounts receivable and collections, fixed assets management, and cash receipts management. Not only are there multiple, different, systems performing similar accounting functions, but there are also multiple ongoing projects to improve these systems without any overall financial systems strategy or plan.

Accounts receivables are managed separately by each department. Some departments have manual systems, some PC-based and some mainframe. There is no automated capability to consolidate the total amount owed to the city by any person or business. Ernst and Young in 1991 estimated, and the Mayor's Special Advisory Committee on Fiscal Policy reiterated in February, 1994, that $3 million per year additional revenue could be collected if a centralized city-

wide (excluding the proprietary departments) accounts receivable system were implemented, and accounts receivable management and collection procedures improved.

Tax and Permit System (TAPS)

The Mayor's Special Advisory Committee on Fiscal Administration also reported a major problem in that the tax assessment and collection system cannot identify businesses in Los Angeles that have not obtained the required business license. It was estimated that tens of millions of dollars in taxes and fees owed the city are not identified and/or collected. A contract is currently being negotiated with a vendor to address the problem of identifying businesses operating in the city without a license, and collecting retroactive license fees. The report also recommended replacing TAPS to further improve fee collection.

Payroll System

The city's payroll system has more years service than most of the people using it.

The city's payroll system is 25 years old and needs many changes to support new tax laws, labor laws and bargaining agreements. The system cannot meet the city's future requirements, such as cafeteria benefits, and needs to be replaced. Moreover, the controllers office estimates that a modern system would save the city $800,000 each year.

Document Management and Workflow

About 90% of the information the city needs to operate efficiently is currently available somewhere, but it is often in someone else's database, or in their desk, or in a filing cabinet. Worse, only about 5% of the information is computerized -

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The City of San Diego has been using an automated voice response system for benefits changes for 18 months. Benefit changes are entered from any touch tone phone. A report of the change is automatically forwarded to the employee, and the payroll data is automatically updated. This reduces costs, allows benefits flexibility, speeds the entire process, and is open 24 hours a day.

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most is only on paper.

In reviewing "best practices" implementation in other organizations, some of the highest hard dollar paybacks we found in technology investments came from advanced workflow processing, which were also the systems which shortened the time to deliver services to the taxpayers, two critical success factor measurements in our performance rating and our competitiveness with other communities. To remain viable, the City of Los Angeles must find ways to deliver better, faster, cheaper. Workflow technologies reduce routine work and handle exceptions letting our workers satisfy the demand to produce most cost effective deliverables

Government has been synonymous with paper intensiveness, and it's simply not possible to overstate the expense of this method of operation. Government offices have

been flooded with documents containing buried information, produced faster than staff could possibly keep up with them. Information on paper must be handled manually, is hard to sort, search, share, transmit, and retrieve - and it is easy to lose, or misfile, which is why we all create expensive multiple copies filed in cabinets taking up costly office space. But the very worst part is that the need to distribute paper copies is what is strangling our business processes.

The city needs better ways to transfer and share the information and to handle long-term storage of information, e.g. information on the city's bridges, tunnels, sewers, and water supply. It needs systems which encourage collaboration by allowing concurrent rather than sequential work. When everyone uses the same information at the same time, they detect flaws earlier, save money, produce better services, and are more satisfied.

Where We Should Be Going

The city should be developing and implementing information technologies, policies, procedures, and standards that empowers leadership, supports and enables customer-driven government, rather than constrains it.

Good public policy can only be achieved when good information is available. The city is rich with data, but it is stored in formats that are incompatible and difficult to access. In addition, the predominant culture is information hoard-

ing, not sharing. In order to make this valuable resource available city-wide and to the public, the city must put in place the infrastructure necessary to support rapid communication and data sharing. This infrastructure must be expressed in terms of wired and wireless needs. The elements of the information technology infrastructure are:

Wide Area Network Connecting All City Facilities

Development of hardware and software standards to support connectivity and data sharing.

Databases that need to be shared by multiple city departments.

Application systems to support city-wide business processes.

Mainframe Data Center

The computing infrastructure previously consisted of a mainframe computer center with phone lines to dumb terminals and printers. However, this is changing rapidly as the technology moves toward distributed computing and personal computers. The key element of the infrastructure is connectivity.

The committee envisages a southern California regional wide-band network connecting the facilities of the city, the county, the state, and other local jurisdictions to support rapid administrative and public safety communications. Sharing such a regional network

will save millions of dollars of duplicative investment, and will provide for planned redundancy for emergency backup.

Functional hardware and software standards are essential to ensuring connectivity across departments and agencies. The standards should be based on 'open', i.e. not vendor specific, industry standards for seamless integration of the

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Arco identified a way to use electronic imaging in lieu of GIS to handle real estate maps and related documents. Maps were scanned and stored as raster (i.e. bitmap) files and the related information was scanned and hyperlinked to positions on the map. These hyperlinks were created during the indexing process. While it may be more expensive to add hyperlinks than to simply index information, it is considerably less expensive than creating a detailed database as required for GIS. Under this system, maps are presented to the users with highlighted positions where additional information is available; a double click brings up the related documents automatically. Monthly savings were $72,000 per year based upon elimination of outsourcing for redrawing and reprinting of maps at the conservator rate of only four maps per month.

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most cost-effective hardware and software to meet user needs. This will provide the required flexibility to select the best hardware/software tools for each function while supporting information sharing and communications.

Sharing data requires consensus on a set of common data definitions and formats not existing today. These definitions and formats

must be readily available to all agencies and to the public who need to access and utilize the information. Having defined the information to be shared, the city needs to build the city-wide databases so that data is entered only once at the source and shared by everyone.

There is no effective city system for city staff to track charges against individuals within the city. We find a critical need for an automated fee status reporting system, usable by city collection staff throughout the city. It must have at least the following capabilities:

- City employees without programming skills must be able to request reports from their individual computers.

- Reports must arrive in minutes, not days or hours.

- Employees must be able to request specific information, e.g. a specific person or geographic area, or by age, or by type of fee owed, etc.

There is no hard information available on how much the city currently loses due to late collection or non-collection, but we believe it is substantial. This system will rapidly repay its cost through improved collections.

The definition, planning, funding, and acquisition for building of this city infrastructure is a critical task that requires consensus funding by

the department general managers and the city's elected officials.

As one example of what we should be doing: Presently, the Survey Division is supplying approximately one-half of its survey data in electronic form. Even though the electronic survey data are used to generate computer aided drafting (CAD) drawings for street design projects, the design process is essentially manual. Installation of three high-end PC's together with survey software and CAD and civil design application software is recommended to improve productivity in the Harbor District Office, at an estimated cost of $60,000. This would be a pilot prior to automating the three other District offices. Appropriate networks would also be needed to ensure effective and efficient data flow. Total cost for all four offices is estimated at $500,000. This will quickly pay for itself in increased productivity.

How We Get There

- Acquire or build, in partnership with private industry and/or other government agencies, a broad band wide area network (WAN) connecting all city facilities.

Implement a wide area network immediately to provide cost-effective and reliable voice, data, and video communications to all city facilities, employees, good public access and the required connectivity to other government agencies.

Integrate the requirements of all city departments, including the Department of Water and Power, the Harbor Department and the Department of Airports, to develop overall wide area networks. The requirements must include a clear statement of wired, and wireless, resource support needed to build the network, and where the resources will come from.

Combine existing independent department projects that are scheduled to invest about $100 million in the next 4 -5 years into a city-wide network plan to minimize costs.

Negotiate partnerships with other government agencies and private industry to share in the acquisition costs and utilization of a southern California regional network instead of building a city-unique network.

Acquire robust automated industry standard network management tools that are essential to the management of network reliability and capacity.

This subject is discussed further in Exhibit 2.

- Evaluate consolidation of existing mainframe computing centers.

Initiate a study to determine the potential cost savings in hardware maintenance, software licenses, systems operations, and support by consolidating the city's four mainframe computing centers (ISD, DWP, Harbor and Airports) into a single center. Such a consolidation could free up technically skilled personnel to support the evolution of distributed processing and local area networks.

- Implement a disaster recovery plan for distributed computing systems.

Make department general managers responsible and accountable for having, and testing, disaster recovery and business resumption plans for their PC networks. Hold the central information technology organization responsible for supporting the departments with guidelines, backup facilities contracts, and wide area network recovery.

- Develop system-wide databases to be shared by multiple departments and the public.

Develop a city-wide hardware and software architecture to support information sharing and communications, based on open systems industry standards, for seamless integration of the most cost-effective hardware and software to meet user needs. Establish policies for ensuring city data is made accessible to all employees, except where specific privacy or security needs prevent.

- Establish a city-wide Geographic Information Database.

The GIS plan should be updated, and implementation accelerated, with strong city-wide leadership to ensure integration and sharing of this valuable information across departments, with other government agencies and with the private sector.

- Re-engineer financial management processes and systems to improve cost visibility and accountability.

Decide whether the existing Financial Management Information System (FMIS) needs to be replaced or whether it could meet future requirements via incremental enhancements. In the short run, while waiting for development of the long-range plan, make improvements to the FMIS system

to provide better cost information in a more timely manner.

- Implement recommendations of the Mayor's Special Advisory Committee on Fiscal Administration.

Procure a city-wide accounts receivable system to recover $3 million annually.

Upgrade the Tax and Permit System (TAPS) which will:

- Reduce cost through reduced paperwork.

- Improve cash flow through more effective collections.

- Process valid permits faster.

- Meet the increasingly complex payroll need by outsourcing payroll services, upgrading the current system, or purchasing a new system.

- Implement a system to provide full document management capabilities, including imaging and workflow management.

Workflow is discussed in Exhibit 7.

- Conduct business electronically.

Contractors and companies conducting substantial business with the city should be required to submit information electronically. The city may be surprised how many small providers will voluntarily interact using electronic media. Requests for Proposal (RFP's) and specifications for new projects should require all documentation to be submitted in a specified electronic format; we should limit paper documentation to those required by current regulation. The city should communicate the determination to support cost-effective EDI implementations at any level in the city. Commercially available electronic data interchange (EDI) software allows paperless purchasing and payment, reducing labor costs and improving cash flow (see Exhibit 5).

- Create a system to collect fees efficiently and reliably.

The city should immediately implement development of a fee collection system. This must run on personal computers across a network. It must be developed using process re-engineering and Joint Application Development methodology.

- Combine existing independent network projects into one plan, addressing all city departments, including DWP, Harbor, and Airports.

- Use well-supported state-of-the-art and Emerging Technologies.

Exhibit 10 identifies fifteen technologies with potential to benefit the city through performance improvement, cost savings, improvements in user-friendlier access, streamlining, convenience, smarter workforce, improved safety.

The city can be a pacesetter by using advanced but current commercially available technologies. The critical difference is how the technologies are combined to add value. Identification technologies as simple as magnetic strip badges can improve public safety. Natural language processing and speech recognition can make it easier for citizens to access city systems. Expert systems can improve the operations of knowledge intensive city departments. Virtual reality and simulations can improve training fidelity.

"Fax Back" could be introduced into all departments that interface with the public. This technology allows people to call from any phone, navigate through a menu, select a particular document, and ask for it to be faxed back. Within minutes, the information is available at the user's site. The equipment is commercially available and simple, and requires no special wiring or special networks. The city could make available information on filing for permits, requirements for business or ordinary residents, updated data from City Hall, etc..

If the city is to benefit from these technologies, we must select and aggressively pursue them.

Develop Strategic Alliances

Where We Are

The Committee was unable to identify any significant ongoing collaborative projects. There are some examples of cooperative information exchange - notably the working group established by the Telecommunication Department with other cities. There is limited interest and willingness to collaborate with other public entities. The existing city infrastructure makes such efforts prohibitively difficult to achieve. Collaboration with commercial entities is even more foreign to the existing city culture. Some city employees recognize this lack, and even see how it hurts the city. The following structural barriers to effective collaboration were identified:

- Few government entities have experience or process tools for partnerships;

- Incompatible data;

- Lack of timeliness and/or accuracy in information exchanged;

- Concerns about privacy and security of information;

- Lack of strategic financial planning and use of cost/benefit analysis (considering factors such as productivity, cost-savings, return on investment) when evaluating information technology and telecommunications proposals;

- High up-front costs for information technology equipment;

- Absence of clear guidelines and standards;

- Political considerations;

- Freedom of information liability and the public's right to know and have access; and,

- Decentralized decision-making on funding as opposed to a centralized, consolidated view.

At the federal level, recognition that government must find new ways to provide customer-driven government has resulted in an Executive Order calling for federal services to equal the best in business standards and requiring federal agencies to survey customers on what they want and whether they were satisfied.

Both the federal and state government have systems that already benefit the citizens of Los Angeles. For example, through the National Crime Network, the Los Angeles Police Department is currently sharing information with the Department of Justice, solving crimes more rapidly. Cities across the nation are conducting studies similar to the work of this committee. By forming strategic and loose cooperative alliances with agencies and organizations in the private and public sector, all parties will benefit.

Where We Should Be Going

To reduce information technology cost and risk, the city must first make collaboration a priority. Staff must work closely with other jurisdictions and the private sector to identify opportunities for joint development and use. The city must participate in the public/private sector solutions. Other cities also are developing capabilities we could share. Los Angeles should create working relationships to optimize the existing resources. Such relationships could:

- Establish a common strategic plan with a common set of rules, regulations and policies that transcend geographic and political boundaries;

- Cooperatively assist in the development of industry standards;

- Cooperatively define user requirements, and ensure that public policy and user applications are developed in response to need, not simply technology;

- Train and educate users on commonly used technological developments and innovations;

- Expand opportunities to use technologies to improve the city's interaction with these entities;

- Jointly implement technology infrastructure regionally;

- Seek federal grant funding for innovative project with higher risk or long term paybacks.

The city needs a considered innovative and documented strategy on collaboration.

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For example:

The city should promote performance-based contracting for information technology. Private firms would install information technology, and profit according to the measured cost or other improvements.

L.A. County is implementing a five-year plan to make the Internal Services Department compete with commercial vendors.

Our committee identified a Disadvantaged Business Enterprise certification project for the federal, state, city, and regional authorities to share an on-line process. This would reduce paperwork for small firms seeking certification, share workload among interested agencies, and free staff for field work to prevent fraud. This is discussed in more detail in Exhibit 3.

Individuals seeking one type of information have a pattern of casually browsing through other information from the same source. Not many people would buy a television set to watch CityView,

but many people who purchased televisions for other reasons now view this Channel. We could use this natural synergy to find partners for distribution of city information. The committee believes that many businesses would pay for the opportunity to provide access to citizens needing to conduct city business remotely. A photocopy store which sells computer access to the Internet could be used as an access point for people who want to fill forms out on-line, and with a swipe of a credit card, pay parking tickets or conduct other business with the city. The entry point is free to the city, and the merchant has improved walk-in traffic.

How We Get There

- Actively Seek Collaborative Opportunities.

City departments should actively seek opportunities for collaboration or joint ventures. The city should create a Round Table of public and private sector representatives, dedicated to external

communications and the internal benefits they derive. It should give funding priority to collaborative projects. GIS and area networks should be addressed immediately to support collaborative needs.

- Define Commercialization Strategies.

The city should immediately recommend a process for a department considering commercialization. It should solicit participation from the business community and outside agencies in preparing this study.

- Support the first goal of National Information Infrastructure.

Develop a national vision which includes an institutionalized process that ranks information technology priorities for the Administration, provides support and funding to achieve them, and coordinates partnerships with industry and state and local governments.

How do we
pay for IT?

How Do We Pay For IT?

In our discussion of collaboration with the private sector, we identified revenue enhancements conceived for our information assets.

However, the single act of enabling the city to capture and reuse the data itself, is perhaps our biggest payoff. It is simply not possible to overstate the wasted dollars and efficiencies of delivering public services under current methods.

Both government and business has been converting from mainframes to client/server database systems for at least the past five years. Initially projects were justified solely on the computing cost savings. It rapidly became obvious that benefits of well-implemented projects extend far beyond the direct cost savings. As data becomes accessi-

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Electronic Imaging Kraft Foodservice, Inc., the nation's second largest broad-line food service distributor ($4 billion in 1993 sales) implemented imaged systems to automate its accounts payable operations. It handles more than 3,000 pieces of paper per day. They bought a $1.5 million system which is realizing an internal rate of return of 30% which paid for itself in just over three years.

*Mike Noble - Director of Finance,
Deerfield, Illinois*

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ble for decision making wherever necessary, it dramatically changes how organizations do business.

Costs are reduced and the organization is also able to function in an entirely new way.

In reviewing "best practices" implementation in other organizations, some of the highest hard dollar paybacks we found in technology investments came from advanced workflow processing, which were also the systems which shortened the time to deliver services to the taxpayers, two critical success factor measurements in our performance rating and our competitiveness with other communities.

Focus on Payoffs from:

MassTax Database: Massachusetts faced a fiscal crisis, with plunging revenues forcing massive budget cuts. Between 1991 and 1993 the department responsible for collecting revenues had been cut 21% in personnel and $11 million in its budget. Installing a mainframe system called MassTax, they tied to other Massachusetts databases, cross-referencing tax debts, bank accounts and other information available to the Revenue Department. Annual revenues collected per employee rose from $4.3 million to $6 million.

- **Capture and Re-use of Information:**

Getting the information into the system once, at the first point at which it is recognized as information, lowers the cost. Creating open, connected systems does not cost money, it saves money. Technology procurements are not just expenditures, they are investments with rapid payback and extremely high return on investment.

- **Increase Revenues by Connecting Systems:**

Look for opportunities such as tying the Permit Review process into the citywide billing system; this potential revenue generator would allow the city to ensure that businesses needing permits were current in their other payments.

- **Use What Already Exists:**

Do not spend dollars to re-invent the wheel. Our report discusses plentiful resources the city could

use to reduce costs of technology implementation:

Under the Reform Organizational Structures and Management recommendations section of this report, we discussed using commercially available off-the-shelf software to save costs, implementation time, and risk.

Under the Establish City Information Infrastructure recommendations section, we discussed using existing fiber optic cables of telephone and cable companies.

- Collaborate: Share development effort, risks and costs.
  - "Develop Strategic Alliances" discusses the teaming with other government agencies to improve payoff and reduce cost, implementation time, and risk.
  - Attach to the Internet to build upon the research and development being per-

Child Support: Until 1991, Massachusetts performed child support enforcement manually with paper files. Employees knocked on doors to collect child support payments. Then the state began to use its existing databases stored information on resident's driving records, unemployment and tax returns. Using these databases together provided for very fast searches for information. Annual child support collections tripled from $5 million to $15 million. Staff time shifted to other activities as the enforcement staff was cut from twenty to two employees. Department collections had averaged 59% of all child support due, and now the rate is up to 76%.

formed under the federal National Information Initiative.

- Identify opportunities for sales or licensing of data to enhance revenues.
  - Develop procedures for teaming.
  - Develop data standards.

- Establish a working group with public and private sector representation.

- Develop procedures on free versus fee-based services.

- Create and provide value-added services on a fee or sponsorship basis.
  - "Improve Public Services" discusses substantial opportunities for value-added services.

Exhibits

Exhibit One: Quasi-Governmental Entity

In reviewing how the city should reorganize to deliver information systems services, the committee found other options to consider than simply combining existing departments or creating an umbrella organization.

If the city were to create a quasi-governmental information technology agency to which it would transfer single-point responsibility for information and telecommunications systems for the City of Los Angeles, employees now working in information technology functions within any department or entity in the city would be employees of this agency. Such an organization would not have been possible with out present technologies which connect individuals and sub-organizations to management and to each other. The ability to orchestrate the delivery of the city's information technology services through a multi-functional, multi-organizational organization, effectively balancing interdependencies, is just one of the values current technology can bring to city managers.

It is the intent of this recommendation to achieve the same level of cultural change sought by the City of Philadelphia when it opted to completely outsource its information technology operations. The committee considered carefully, but did not choose to recommend a 'Philadelphia approach', due both to the caliber of the staff we found in the city and to our conviction that a 'no lay-offs due to technology' policy must be a firm commitment to achieve rapid implementation of the city's technology needs. Given the pent-up talent partially unleashed during our four months of interaction with city information technology and telecommunication staff, we believe that a quasi-government approach could accomplish the same mind-set results, with far less disruption to the progress already underway. The need for a quasi-independent agency to conduct these functions, serve as a cooperative venture conduit to external information and telecommunications industries

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The City of San Diego created a quasi-governmental agency, a wholly owned, non-profit corporation, called the San Diego Data Processing Corp., to oversee and direct development and implementation of that city's information technology strategy. San Diego, which claims to have more computers per capita and a higher density of fiber optic cable than any city in the U.S., discovered old organizational models built on 19th and 20th century business philosophies were not conducive to progress in the information age.

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and provide multi-year planning and budgeting cannot be overstated.

Our recommendation to the city would be to investigate such an entity is categorized as both *high priority* and *early start*. We find that much of the cost/benefits investigation of such an approach has been performed by other cities and by major utilities, giving the city a body of existing reference

material to support its decision making process. Several examples of such entities, public and private, exist.

The city should use outsourcing to control costs without slashing services. Employees and management must work in tandem to develop programs which allow employees to prove they can, with adequate training, be more competitive than outside contractors. Teamwork, fueled by a shared desire to improve processes for cost savings, is the key. The city should provide experts in process improvement, teaming, and technical training. Competitive benchmarking should be used to empower employees, letting them compare the results of their decisions against other successful organizations. Employee teams should be given a reasonable transition period months, to avoid outsourcing by meeting the lowest competitive bid.

When San Diego chose to position itself as "an intelligent information city - a global city of the future, it examined the importance of information technology to its future and started to build widespread community awareness for its concept of "the city of tomorrow, today."

Our committee believes that the opportunity to work free of restrictive policies and procedures which inhibit the effectiveness of their actions and decision making processes, will bring significant job enhancements to the employ-

ees of the city's new information technology organization.

The basic ground rules would reflect the type of cooperative employee/management agreements being implemented throughout the country in organizations faced with the same outsourcing questions. These technology programs only work if they contain 'no displacement - no reduction' in salary, expert training and continuing help-desk support conditions. There would be changes in job requirements and upgrades in some job classification levels, as the new skills demanded on the job are achieved by the employees.

Finally, it must be recognized up front that a few city employees simply won't want to work in the changed conditions of increased productivity through teamwork. The city will need to have in place voluntary severance and 'golden handshake' retirement programs.

Exhibit Two: Strategic Information Network

City staff in different buildings currently cannot communicate efficiently. Only a few buildings share electronic files. There are no standards for citywide sharing of electronic information. This is a significant barrier to effective operations.

The city, the county and other jurisdictions are investing hundreds of millions in fiber optic cable networks throughout the region; the city's Telecommunications Department has been a leader in this effort. We have current access to approximately 70 miles of city high speed, broad band fiber optic cable. With an emphasis on seeking inclusion in jointly developed systems, or use of private sector developments, the city should expand this effort.

Network

The single most important opportunity for realizing benefits for the city, identified by all task forces, was implementation of a city-wide network infrastructure

The city should:

- Immediately authorize the planned implemenation of a high-speed city-wide information sharing network.

- Within three months, provide a plan which would deliver standard Ethernet capability between City Hall and every city building within one year.

- Obtain, as soon as possible, a commitment from the City Council to fund the complete implementation of both the information links and the individual workstations which the departments will need to implement this plan.

- Install the information transfer lines, and purchase computers, as departments are ready to use them. Those city department managers willing to lead in this implementation - and there will be problems to be overcome - must do so knowing that their equipment will be made available when they need the equipment.

- Mandate technologically compatible facilities, by requiring all new, leased, or refurbished facilities be "pre-wired" to allow electronic data communication within the facility and provide links to allow the facility to communicate externally

The city should strongly support continuous development to meet a growing comprehensive communications environment of voice, data and video. Our community's commercial providers of wire and cable services have a strong network of existing lines and implementation plans for expansion. The city could collaborate with all communications providers, gaining flexibility in adding services,

reducing costs, and above all minimizing delays.

Network Management Tools

The city lacks automated network management tools to map the topology, list the components contained in the network, manage and control the performance, receive notification of malfunctions, or gather statistical data. The City is operating its systems in the dark, and must invest in these basic operating tools.

E-Mail

The city should implement *compatible* electronic mail citywide. Compatible systems, running on a common platform, would enable city staff to share information, work jointly on projects and provide efficient means for daily communication.

- Starting with the Mayor's office, the city should make all requests for action (memos requiring action items and implementation action) mandatory on e-mail.

- The new city directory (discussed under "Improve Public Services") should contain e-mail addresses for all parties within city government and selective outside resources.

Exhibit Three: DBE Certification Electronic Clearinghouse

The city currently has multiple city agencies which certify DBE/MBE firms:

- Department of Water and Power
- Airports
- General Services Administration

In addition to the city entities, numerous other Los Angeles area organizations require certification, as does the state of California. Minority firms desiring to contract with local government must provide the same information to all these locations, keeping each file current. Several of our task force DBE firms were certified with more than 30 such entities. DBE firms are, by definition small firms; it is an inconceivable burden to require them to submit 'telephone book' sized certification applications to 30 different entities. Many contractors who would otherwise be qualified and eligible simply report the cost of compliance is too high to participate in the system. Firms which do participate spend thousands of dollars in staff time each year just to remain in the system.

The cost is also too high for government. Every entity to which the certifications are submitted must review, process and store the same information. Site visits must be paid to the offices of the applying firms, using up staff time for both the agency and the firm, not to mention scarce travel budget dollars if the firm is non-local.

Past attempts to establish single-certification have been unsuccessful because: a) agencies had concern that other agencies might not be as thorough or set as high a standards; no local agency has been willing to relinquish its responsibility for the review process. as their agency and b) DBE firms were concerned that having non-local agencies capable of certifying without local inspections would expand already existing fraud in the program.

During the work of our committee, the Synthesis Task Force created a vision of a 'one-stop' DBE certification program which would provide any agency subscribing to the system access to original DBE submissions. (Enter once, access many times.) The applying firm could submit its application on paper to the nearest or most convenient acceptance point, and the forms would be electronically scanned to become part of the central database for the state-wide system; firms would also be allowed to enter their forms electronically using an approved 'signature stamp', (followed until the regulations are changed by a paper copy of the signature page with notarization).

Time limits would be established for the processing of the application by the 'system wide' agency. DBE firms are entitled to responsiveness, which they have not been getting due to short staffs and limited travel budgets. The 'sponsorship rules' are still being envisioned by the participating agencies, but the concept would be that each agency would allocate a certain portion of its staff time to processing applications which belong to the 'system' as opposed to just that local agency.

Assume a firm delivered an application to Los Angeles County MTA, where it was scanned into the system within 24-hours of receipt. The submitted application would now be available system wide. If the next week the DBE firm had an opportunity to respond to an RFP in Oakland; BART could now view the file, see that it needed processing and (since RFP response certifications are always given priority processing) BART could start reviewing the materials. When finished, BART would notify the next available local Los Angeles 'sponsor' (as identified by the rotation list in the database) and that entity would schedule the on-site visit for the following week. By the time the proposal was submitted, the DBE firm would be certified - and all future agencies needing to know the certification status, and wishing to confirm if they concur, would have access to the full records.

Timeliness and cost effectiveness for everyone involved are not the only advantages such a system would offer. Agencies will be able to record comments in the central files, so all would benefit from the work done by others. It would be much more difficult for questionable firms to avoid being exposed.

Benefits Internal to the city:

- With certification made easier, more firms will apply, increasing the pool of disadvantaged and minority contractors, allowing more opportunities for minority contracting.
- City agencies will spend less time on certification paperwork, with equal access to in-

formation and verification. This allows more time checking against fraud with no loss in management control

■ It would end the dispute between the departments as to which should be responsible.

Benefits External:

■ This project would provide an early, visible indication of the city's commitment to improvement.

■ It would demonstrate the ability of the city to work in a successful partnership

■ The federal government may be willing to provide funding - or at a minimum the city would be obligated only for its end of the system links.

The city has a potential ally in this objective:

An important aid to this proposed project, is that USDOT regulations on the certifying of DBE/MBE firms are in the final stages of revision; it is anticipated that DOT will provide for a single point of registration within each state and that the site for such processing will be the state DOT. Thus it was a natural to ask Dick Weaver, as a part of his role as Deputy Chair of the External Task Force of our Committee, to have Caltrans chair DBE Certification Program Interagency Team.

Contact is in progress with US-DOT, via the offices of Rodney Slater, Administrator FHWA and Gordon Linton, Administrator FTA, and we are investigating the possibility of getting the pilot for this program funded under a Demonstration Project grant.

We recommend that the city support the proposed DBE Interagency Electronic Certification group in its immediate preparation of an RFP for implementation of this system, and offer to serve as one of the key pilot program entry points. We also ask that the Mayor's office contact the county, other cities, and governmental entities within the Los Angeles basin to seek their input and participation in this program.

This recommendation would create a system which:

■ Bypasses an inter-departmental turf battle.

■ Creates a highly visible change inexpensively.

■ Beneficially touches several diverse segments of the city.

Exhibit Four: Best Practices Program

Keep the Vision Alive

The city staff members who have served on our task forces have been exposed to the concepts of a substantial array of technology implementations not yet in use in the city. The committee believes it would be of significant benefit to expose all information services staff members, city management, and interested elected officials to examples of these technologies in use in 'Best Practices' organizations.

We recommend that the city hold its first "Technology Best Practices Workshop" in conjunction with the Government Expo Conference to be held in Los Angeles in September, 1995. Within 45 days of that Expo Conference, we recommend the city commence an in-house program offering the following characteristics:

- **Case Studies**: These should focus solely on examples of state-of-the-art *organizations* from *inside* and *outside* government. We cite the use of case studies rather than dem-

onstrations of technologies, to focus attention on organizations similar to the city that have used cost-effective technology in ways which *transformed their total approach to delivery of business services* into a state-of-the-art business model.

- Papers and discussion groups which identify what is different about how the "world class" entities are using information technologies:

  - What do they do differently?

  - What different benefits do they receive?

  - Which of these benefits did they expect?

  - What were some of the unexpected benefits they discovered after they implemented the technologies?

  - What has been their cost/benefit experience?

  - Seek examples of the type of 'paradigm shifting' concepts we recommend in our report.

- Provide demonstrations of how integration of information allows the first person who speaks with a caller to process a transaction requiring multiple levels of approvals in different geographic databases.

- Collect, distribute, and maintain in the Los Angeles Public Library a list of resources:

  - Articles and books on effective public and private sector implementations.

  - Videos which show how the entire community of the near future functions differently with technology.

  - Ensure these remain easily available to city staff who wish 'refresher' ideas or to amplify concepts.

Exhibit Five: Electronic Procurement System

The city's current procurement systems cannot even reliably match orders, delivery, and receipts. The city routinely misses early payment discounts, or pays for items not yet delivered. Numerous off the shelf applications are available for electronically ordering and paying for goods.

Establish an Electronic Procurement System

- Immediately convene a working group from city staff to select an off-the-shelf EDI procurement system;

- Authorize clearcut authority and responsibility, and encourage obtaining an independent consultant to support the selection and training process;

- Implement the system immediately. It should be on-line within six months.

Benefits to the city:

- Better cash management.

- Reduced labor.

- Improved delivery

- Potential for reduction in inventory

Exhibit Six: Re-engineering the City

The processes used throughout the city are outmoded. Few if any have had the benefit of modern management approaches. City staff need support and resources.

Provide Training in the Concepts of Re-Engineering

As a key part of the training programs we recommend to be implemented by the City, training in understanding the concept of business process re-engineering is a must. Staff at all levels within the city must understand that real productivity is not doing the old job 10 times or even 100 times faster... real productivity is not doing the old job at all. City staff must be taught to re-look at the end objectives, forget how you do it now, re-design a whole new way to get there - one that takes advantage of technologies' real contribution - the avoidance of work.

Provide technology first to departments willing to re-engineer their processes

Literature review shows that technology is wasted when not accompanied by re-engineering of processes across departmental lines. To avoid automating obsolete practices, we recommend that departments willing to work together to re-engineer their processes (even including departmental restructuring, if necessary) should be eligible for technology first.

Re-engineering is "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed." Reengineered processes are recognizable by such characteristics as reduced number of distinct jobs, workers who have the information they need and are expected to make decisions, aggressive use of modern information systems, processes performed when and where they make sense, fewer checks and balances and reconciliation steps, and customers handled by one person. Re-engineering is not easy; it requires training and hard work. Company after successful company has shown improvements beyond any reasonable expectations. Cycle time and labor cost reductions of five and ten times are not unusual.

Looking at the individual costs of each function, and eliminating or redesigning those with high cost or time requirements, produces and entirely new vision of cost reductions based upon numerator values. Conceptualize the end objective and then examine unusual ways of getting there.

Technology offers the opportunity to conceive ways to cut costs, provide increased and better services and restores the meaningful work of city staff, but gaining the benefits requires thinking in entirely new ways about the needs of the city.

The city must:

- Establish an organization to provide re-engineering support and expertise.

- Establish policies for monitoring and reporting the performance of re-engineering projects.

- Establish a fund for re-engineering projects. This should be provided to the highest-payoff opportunities at any given time. Some of the savings generated should be repaid to this fund, some should be returned to the department involved, and some should be returned to the general fund.

- Develop, through whatever combination of training and hiring is appropriate, a core staff capable and experienced in the re-engineering approach.

- Within three to six months, have at least one pilot re-engineering project underway, in addition to projects specifically mentioned above.

- Once the first few projects have been successful, plan for re-engineering every process in the city. This must become an integral part of the culture.

This is, in fact, the completion of the transformation of the city government to achieve a modern, efficient, responsive organization.

Exhibit Seven: Workflow Systems

Almost every department surveyed identified an immediate need for a document management/ imaging system. The committee recommends the incorporation of workflow capabilities to move documents through a defined procedure.

Experience with industry and public agencies has shown that these systems, especially when implemented in conjunction with process re-engineering, can provide substantial benefits. Just the savings due to elimination of filing cabinets in some cases recovers the entire "hard" cost of the systems. They also substantially reduce labor hours, reduce processing cycle time, improve decision making, reduce errors, and improve service by eliminating a major source of delays.

Management is frequently interested in the ability of workflow integration to provide statistics about the efficiency of business processes; database integration can track processing times and be linked to a statistical or graphics package to provide powerful business analysis tools. Getting adequate information to responsively adjust the workflow process allows the department to keep reducing the processing times.

The city should:

- Immediately convene a working group of prospective workflow user department representatives and the Information Systems Department.

- Authorize this group to begin selecting either one imaging system, or define requirements for a range of compatible products.

- Retain the services of a consultant to assist.

- Establish a budget for immediate implementation of workflow improvement projects.

These projects must still be individually justified based on either direct cost reductions, revenue opportunity, or substantially improved service to the public.

- Determine the conversion costs of existing sets of paper records and recommend the staging of the conversion of record sets.

- Select and train a number of ISD personnel in process re-engineering. As each department begins a project, process re-engineering must be conducted as a first step.

- Enter into volume purchase agreements with strategic vendors

The information to be captured is one of the essential components which will enable the single point response delivery of services proposed by our report.

Exhibit Eight: USA CityLink

USA CityLink is a cooperative project providing free information about cities throughout the U.S. using Internet. It provides the on-line directory - once an individual connects to USA CityLink, they can connect to any on-line city with a mouse click. If L.A. used this innovative graphical service, over 30 million Internet users around the world could browse through the city and preview its attractions.

Looking for a meal or a night out? With the click of a mouse, images from the city appear with a brief description. Need a hotel? Click at "Where to Stay" and a list of area hotels, their rates and phone numbers appear. Want some great Mexican food? Click on "Where to Eat" and you will have a list of local restaurants and their specialties.

San Diego, for example, already provides extensive information through USA CityLink. People throughout the world can, and do, view information not only on city services, but also on commercial opportunities. The information is sufficiently detailed and specific that the user can browse specific stores in specific shopping malls. The information includes both text and pictures. The system is supported almost totally by local businesses.

With this information readily accessible, the city would enhance its ability to promote tourism and promote a public image of a friendly environment for companies to do business in the city. To echo a query of the Tannenbaum report "how much future revenue can the city derive from strengths such as favorable year-round climate; business-efficient time zone; accessibility and proximity to international markets; the entertainment industry; internationally acclaimed educational and science and technology institutions; and some of the most popular tourist destinations in the world?"

Information to be displayed on our city could include:

Points of Interest

Images of L.A.

Local Attractions

Recreation & Travel
- *Hotels*
- *Car Rentals*
- *Museums/Gardens*
- *Restaurant Guide*

Emergency Information

Entertainment
- *Television and Radio*
- *Theaters*
- *Concerts*
- *Movies*
- *Special Events*
- *Sports*

Visitor Information

Employment Opportunities

Transportation
- *Public Transportation*
- *Airline 800 numbers*

Commerce & Industry

Government Services

L.A. City/County Schools

Universities and Colleges

Weather

Local Time

Exhibit Nine: Electronic Bulletin Board System

The committee supports the immediate improvement and expansion of the recently established bulletin board system (BBS), which allows residents to get information and send messages to city officials.

To make the BBS a viable product it needs:

- Reliable hardware, with enough telephone lines to support a reasonable number of callers.

- Permanent support staff and funding.

- Far more uses, including city directory services.

Our committee recommends that the city immediately:

- Retain a consultant to upgrade the BBS system, and train the staff in its support.

- Pending the reorganization of information technology operations, assign responsibility for BBS operations at a management level which will ensure that the system provides value to all.

- Ensure that all city departments promptly provide up-to-date information, and that they read and respond promptly to citizen's requests or comments.

- Monitor the use of the system, and install additional access lines as usage increases to ensure that calls are handled promptly.

- Train non-information technology city employees in its use.

- Support the system by developing a guide to city services and an employee directory, available to citizens and employees.

This:

- Affects virtually all the city departments and the community at large.

- Assists both the public and the business community.

- Projects a positive, open, accessible image.

(Note: This L.A. system, currently called CityLink, has no relationship to the USA CityLink project discussed separately in Exhibit 8 of this report.)

Exhibit Ten: Current and Emerging Technologies

Our committee identified the following technologies as currently available and capable of benefiting today's city operations.

Technology	General Use	Value Added	City Use
Expert Systems	Knowledge capture and distribution Instruction and Training Help desks	Performance improvement in knowledge-intensive environments	City codes, policies, and procedures advisory Instruction for technical employees (Building and Safety, DWP, Airports) Instruction for business process Operation and maintenance of city equipment Customer service support
Natural Language	Information retrieval Language translation	Enable speech recognition User friendliness	Front end for public access to city systems Translation of city literature to other languages (for English speaking citizens and tourists)
Robotics	Package handling Repetitive tasks Hazardous tasks	Cost saving Safety	Automated baggage handling Material handling at city plants
Speech Processing	Remote information retrieval Access by the physically challenged	User friendliness Improve interface fidelity	Telephone access to city systems Kiosk Data capture for meter readers Telecommunication devices for the blind
Intelligent Agents	Information search Information screening	Save time	City codes and policy search for business start-ups Public access to event information Library searches Monitoring and managing of public input (e.g., complaints or requests for service) Parking advisor Police and fire investigations
Object-Oriented Databases Intelligent Databases	Repository for robust information (e.g., knowledge)	Enable intelligent systems Improved information fidelity	Provide infrastructure for city intelligent systems Financial analysis
Distributed databases	Integrate disbursed databases	Seamless access to information	Integrate city departments
Mass Storage Jukeboxes Solid State Disks	Image storage Document archiving Storage of digital video	Random access to documents Enables video on demand	Employee training and instruction Review of public hearings and council meetings Parks and Recreation activity description
Wireless	Automatic remote notification Global positioning Remote instruction Remote data	Streamline processes Reduce span time Freedom	Police and fire vehicle location Data capture at receiving docks Onsite access to codes by Building and Safety

	capture		
Local Area and Wide Area Network Technology	Shared information Electronic mail Video conferencing	Accessibility Convenience Cost saving Enables video on demand	Access to information from other government agencies
Virtual Reality	Training Design	More realistic training	Training and instruction for fire fighters
Simulation	Training Planning Design	Better allocation of resources	Transportation and traffic planning City planning Baggage handling and analysis at airports
Forecasting Scheduling	Planning	Better allocation of resources	Resource consumption planning at DWP Transportation and traffic planning
Identification	Security Inventory management	Safety	Electronic signatures for paperless documents Security access at city airports
Geography	Location Topology	Cost saving	City land management Route planning for transportation

Current and Emerging Technology Definitions

Intelligent Systems

Intelligent systems which are also known as expert systems or knowledgebased systems encode, retain, and deliver knowledge on subject domains. They can be used to deliver knowledge for training, instruction, or advise. They differ from traditional systems in that they allow information to be represented and retains as heuristics (rules) in addition to just data.

Natural Language Processing

Natural language technology allows computer users to communicate with their application software with natural human discourse. This is beneficial because it allows novice users to communicate with very robust applications without extensive training, thus reducing the level of computer literacy required. The two components of natural language process are language understanding where the computer must understand the human's discourse and language generation where the computer generates sentences. Note that natural language processes can be performed separate from speech processing.

Speech Processing

Speech processing technology allows the computer to understand spoken words and generate speech. True speech processing requires natural language processing because language understanding must be used to perform speech recognition and generation.

Intelligent Agents

Intelligent agent technology is software that works in the background on behalf of a user to perform some service or locate some information. For example, it could sift through a user's incoming mail and pull out what may be important to that person after trained on his interest.

Object Oriented Databases

Object oriented databases store information as objects in contrast to traditional databases that store information as tables. This enables more intelligent applications because objects provide a more accurate representation of the world than tables. Also, object oriented databases leverage the power of inheritance where by an object will inherit attributes and behavior from the class of objects it belongs to. For example, a motorcycle object will inherit the attribute of wheels by belonging to the class of vehicles.

Distributed Databases

Distributed databases merge information that are physically located in separate databases into one logical database. For the user, the data seamlessly appears to reside in one physical database.

Wireless Technology

Wireless technology allows information to be transmitted to a users computer remotely. This is beneficial to applications running on laptop or hand held computer devices.

Mass Storage Technology

Mass storage technology provides solution for storing data that requires high capacity, such as digital video files. Optical techniques are often used.

Digital Video

Digital video is video media that is stored an digital rather than analog form. This technology provides direct access to any part of the video clip and also facilitates editing.

Simulation

Simulation software models and emulates a process, condition, or process on a computer. The model represents the inputs, outputs, and transformations within the simulated environment. The model can be used for what-if analysis and creating scenarios for training.

Forecasting and Scheduling

Forecasting algorithms predict outcome based on historical data. The forecast can be used for long term capacity planning as well as short-term queuing analysis. Scheduling algorithms analyze tasks requirements and available resources to achieve optimization. Intelligent schedulers use heuristics (rules of thumbs) to reduce the time to find an optimal decision.

Identification Technology

Identification technology is used to identify people or physical items for security and tracking. Identification techniques include badges, digital signatures, retina scans, and bar codes.